DO COLLEGE ENDOWMENTS MATTER? THE CASE OF EDUCATIONAL SPENDING

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ABSTRACT

The relationship between college tuition and college endowments has received substantial attention in recent years. During the 1990's college endowments were growing at double-digit rates at the same time that the tuition rates charged by colleges was also rising significantly. College administrators rationalized this somewhat confusing phenomenon by responding that everyone benefits from increased endowments, both students and faculty, eventually.

In this paper, the effects of college endowments on the amount colleges spend on educational spending per student will be analyzed. A model explaining spending per student is estimated for a sample of 180 private four-year colleges using as independent variables characteristics of the school such as type of institution, admission=s selectivity, urban or rural school, and student-faculty ratio; tuition; and endowment per student. The results show that endowment per student has a significant and positive effect on educational spending per student.

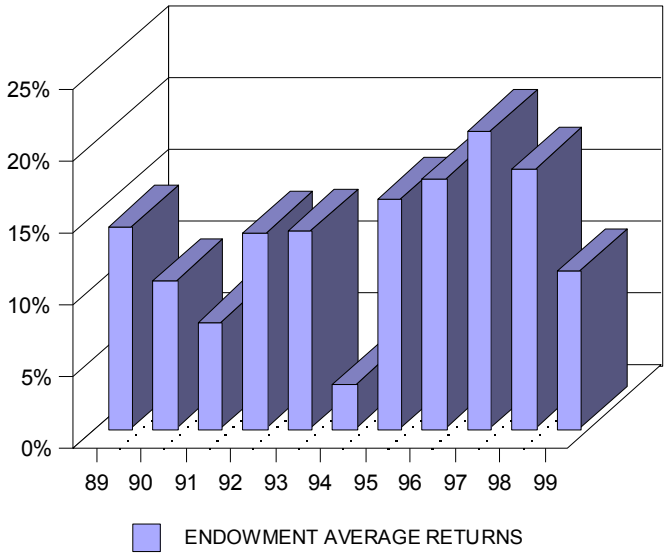
INTRODUCTION

College finance is a topic that generates much interest as well as confusion in today=s world. The relationship between college tuition and college endowments received substantial attention in the 1990's in the popular press because at the same time that endowments grew at double-digit rates, tuition was increasing twice as fast as the overall cost of living [7, p. 46]. Parents and students were confused by the sharp rise in tuition in times when colleges were boasting record endowment growth, in terms of both market rates of return and contributions. Faculty members were also baffled when they hear of the growth in the endowments and yet simultaneously saw the administration having difficulty balancing the operating budget. A faculty member at Cornell University explained the faculty viewpoint by saying AAt just about every faculty meeting at Cornell University, where I teach, someone asks why the spectacular growth in the endowment - which more than doubled during the 1990's, and now approaches $3 billion - has not led to generous outlays for academic programs and faculty salaries@ [1, p. B8].

The answer from the administrators always pointed out that increasing endowments do lead to some increases in the operating budgets, yet much of the endowment is designated for special purposes. They further asserted that the endowment=s purpose is not only to help pay for current expenditures but that it must also help provide for future generations of students and faculties. Most colleges follow a spending rule, which designates that a percent (typically between three and five) of the income generated by the endowment may be spent for current operations.

This *corpus* for spending is generally based on the average value of the endowment over a three year period so that large increases in the endowment in one year are not felt in that or even the immediately subsequent year=s operating budgets. For 1998, the National Association of College and University Business Officers (NACUBO) survey shows that 70% of the respondents spent a prescribed percentage of a moving average of the market value of their endowment. Further, some colleges only spend out of actual cash returns, such as interest and dividends, ignoring capital gains. Basing spending upon only realized cash returns would further accentuate the difference between the increase in the size of the endowment and the increase in spending. Those that do include capital gains in the formulas for the payout often only include a portion of the capital gains. Figure 1 illustrates the growth rates in college endowments over the past ten years.

Figure 1
Endowment Growth



Most revenues for the operating budget of colleges and universities, out of which per student educational spending is funded, are generated from tuition. This money also goes to pay for other expenses such as financial aid, utilities, staff and administrative salaries, and student services. Increases in tuition have been used to provide additional revenue for these other expenditures. In fact, schools often find themselves in a situation where much of the increases in tuition are used to pay financial aid in order not to lose students which leaves little to be used for funding other services.[1]

In a previous study [4], the authors examined the relationship between the size of private college endowments and faculty salaries. A positive and significant, yet small, effect was found. The size of the effect was greatest for full professors and decreased moving across the other ranks of associate and assistant professors. This

paper addresses the broader question of what effects a larger endowment will have on institutions of higher learning by looking at educational spending per full-time equivalent (FTE) student. Educational spending per student includes spending on all instructional divisions of the institution, of which faculty salaries are but one component. Educational spending does not include administrative expenditures. The present study is limited to private institutions since at public schools the issue is confounded by the fact that they receive much of their funding from state appropriations. A model for determining educational spending per student at different institutions is developed in the next section, followed by a discussion of the results obtained from a sample of 180 colleges and universities. The final section contains the conclusions.

MODEL AND DATA

Educational spending, as defined by Petersen=s college guide [12, p. 14] is the dollar value of average expenditures per full-time equivalent student for all instructional divisions of an institution. Includes general academic instruction, academic remediation, adult education, tutoring, and vocational and technical instruction. Does not include expenditures for academic administration.

This number is self-reported and therefore might be calculated differently by different institutions. One institution with which the authors are familiar calculate educational spending by adding all faculty salaries and benefits and academic departmental budgets, plus the expenditures, minus salaries and benefits, of academic support departments such as computing and the library. It can be thought of as a measure of how much it costs to educate a student, ignoring all administrative costs, the costs of providing student services such as counseling and extracurricular activities, and the costs of physical plant.

To determine how college endowments affect educational spending per FTE student, a model is proposed that includes independent variables describing the institution such as the type of school, the selectivity of the school, whether the school is urban or rural, the student-faculty ratio, and the size of the endowment per FTE, and tuition. The model used is of the following form:

$$\text{SPENDING} = \beta_0 + \beta_1\,\text{IIA} + \beta_2\,\text{IIB} + \beta_3\,\text{SELECT} + \beta_4\,\text{SFRATIO} + \beta_5\,\text{URBAN} + \beta_6\,\text{ENDOWFTE} + \beta_7\,\text{TUITION} + \varepsilon.$$

The variables are defined as follows:

SPENDING	dollar value of the expenditures per FTE undergraduate student for all instructional divisions of the institutions, adjusted for differences in regional costs-of-living.
IIA	dummy variable equal to one for colleges classified as IIA according to the AAUP rating scale; 0, otherwise.
IIB	dummy variable equal to one for colleges classified as IIB according to the AAUP rating scale; 0, otherwise.
SELECT	equals 1 for schools with admission standards classified as most difficult; 2, very difficult; 3, moderately difficult; 4, minimally difficult; and 5, noncompetitive.

SFRATIO	student-faculty ratio.
URBAN	dummy variable equal to 1 for institutions classified as either urban or suburban; 0 for those classified as rural or in a small-town.
ENDOWFTE	the market value of the school=s endowment in 1998 per FTE, in thousands, adjusted for differences in regional costs-of-living.
TUITION	the school=s tuition in 1998-99, adjusted for differences in regional costs-of-living.

The sample is comprised of 180 private, four-year colleges and universities.[2] Descriptive statistics for the variables used for the sample data are provided in Table 1. All data refer to the 1998-99 academic year. The data for the institutional classification are from *The Chronicle of Higher Education* [14]. The data on college endowments are from the National Association of College and University Business Officers (NACUBO) [10]. All other variables are from *Peterson=s 4 Year Colleges, 2000* [12] and are self-reported by each institution. The variables that are measured in dollars are adjusted for differences in the cost-of-living around the country by dividing by the regional CPI for 1999 [5].

Table 1
Means (Proportions) And Standard Deviations Of Variables

Variable	Mean (Proportion)	Standard Deviation
Spending	$5,404	$3,368
Iia	.2611	
Iib	.6611	
Select	2.53	.6638
Sfratio	12.26	2.61
Urban	.6167	
Endowfte	$63.12	$82.13
Tuition	$10,684	$2,516

For the sample, the average amount of educational spending per undergraduate student is $5,404. Twenty-six percent of the schools are classified as IIA, sixty-six percent are IIB, leaving only eight percent of the sample that are classified as I or doctoral institutions. Sixty-two percent are located in urban or suburban areas. The average selectivity rating is 2.53 which is between the rating of very difficult and moderately difficult. The average student-faculty ratio is relativity low at 12.26. Real endowment per FTE is $63,115 and the average tuition is $10,684, both adjusted for differences in regional costs-of-living.

Linear regression analysis is used to estimate the relationship. The control group is comprised of rural, doctoral institutions. It is expected that IIA and IIB schools will have lower educational spending per student than doctoral institutions

because of the higher costs associated with providing graduate programs and the fact that SPENDING is defined per undergraduate student. The more selective schools are expected to pay higher salaries and to provide higher quality educational programs and since the selectivity variable gets smaller as selectivity increases, the sign on the coefficient on SELECT is expected to be negative. The student-faculty ratio is expected to have a negative relationship with educational spending per FTE since the more faculty members per student (the inverse of the student-faculty ratio), the greater the salary component of educational spending. Also lower student-faculty ratios may be consistent with more prestigious schools which would hire more prestigious faculty and in order to get a more prestigious faculty, higher salaries would be needed.

Real tuition is expected to have a positive effect on educational spending per student since the higher tuition, the higher revenue generated by tuition and the more money available to pay for instruction and other educational services. Finally, it is expected that institutions with larger endowment per FTE will have higher per FTE educational spending since most schools use some percent of the income from their endowment to fund the annual operating budget.

EMPIRICAL RESULTS

The above specified model is estimated using linear regressions for the educational spending per student. The results are in Table 2. The F-test for the overall significance of the regression shows that the regression is significant at the 0.01 level of significance. The R-square is 0.56. All estimated coefficients have the expected signs, yet the selectivity of the school and the urban/rural distinction are

Table 2
Regression Results

Dependent Variable: Spending

Independent Variable	Coefficient	(P-Value)
CONSTANT	10502.46***	0.0000
IIA	-3060.46***	0.0000
IIB	-3649.68***	0.0000
SELECT	-373.03	0.3537
SFRATIO	-356.40***	0.0000
URBAN	431.76	0.2343
ENDOWFTE	11.55***	0.0000
TUITION	.2275**	0.0170
R-SQUARED	0.56	
F-STATISTIC	32.96***	0.0000
N	180	

** Significant at the 0.05 level.
*** Significant at the 0.01 level.

insignificant. One possible explanation for why the selectivity variable is not significant is that it is moderately correlated with several of the other independent variables: the student-faculty ratio (correlation coefficient is .5458), the endowment per FTE (correlation coefficient of -.5565), and tuition (correlation coefficient of .5131).

Schools that are classified as IIA and IIB have significantly lower average educational spending per FTE than do schools classified as I or doctoral institutions. This is as expected since doctoral institutions have the added expenditures of providing graduate instruction. The student-faculty ratio has a negative effect on student spending. Real tuition and the size of the endowment per FTE both have positive and significant effects on educational spending as expected. Comparing private institutions, approximately twenty-three cents out of an additional tuition dollar is used for educational expenses per FTE, with the other seventy-seven cents being used to cover other costs such as administrative salaries and overhead.

For an additional $1,000 in endowment per FTE, across institutions, an additional $11.55 of educational spending per undergraduate FTE results. While this number might seem small, one must remember that generally colleges use only part of the income from the endowment for the current operational budget.

CONCLUSIONS

This research demonstrates college endowments do have positive and significant effects on private, four-year institutions= educational spending as one would expect. Institutions with higher endowments have the ability to pay higher salaries and offer more educational options for their students, holding other things constant, since the income from the endowment can be used to fund a part of the operating budget. Comparing private institutions of higher education, one thousand additional dollars of endowment results in an extra $11.55 spent on the educational budget. Parents and students can be assured that increases in the endowment do lead to higher educational expenditures although the effect is very small. The smallness of the effect is due, in part, to the fact that only a small percent of the income from the endowment is used for the current operating budget. Since schools use different spending rules to determine how much of the endowment income is applied to the operating budget and how much is reinvested, how additional dollars of endowment result in additional educational spending would vary among institutions. It should also be noted that these results would be different if the market rates of return were lower than they were during the 1990's as they are today. With the recent downturn in the stock market and in interest rates, it is expected that an additional dollar of endowment would lead to a much smaller change in educational spending since the increases in the operational budget are based on the income from the endowment, not just the size of the endowment.

To answer the question of what other effects college endowments might have, further research is necessary. The relationship between college endowments and tuition is one that has received the most attention in the popular press, and is the area that the authors will address next. In addition to that, there is also the issue of the effect of large endowments on other budgetary areas of college life such as the size of the administration and administrative salaries and spending on student services. It

seems that the constituent stakeholders in higher education need to be assured that the focus of the administration on the size of the endowment is warranted and leads to benefits for the entire academic community.

ENDNOTES

1. One innovative school, Washington and Lee University, has an endowment specifically for financial aid so that they do not get in the situation where increases in tuition are used to pay financial aid. In 1998 this endowment was valued over $124 million [16, p A37].

2. The sample was derived by taking all private institutions for which data on all variables was available. For 1998, NACUBO published endowments for 343 private colleges. Of these, only 180 had complete data for all variables in *Peterson's 4 Year Colleges, 2000.*

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